FINAL REPORT

CANADA – QUEBEC
SPECIAL SUBSIDIARY AGREEMENT
(1987 – 1992)
ON FOREST DEVELOPMENT OF THE
UPPER NORTH SHORE

Canada

Québec

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SUMMARY

This study is the final report of the Canada-Quebec Special Subsidiary Agreement on Forest Development of the Upper North Shore (1987-1992). The main objective of this Special Agreement, which ended in fiscal year 1992-1993, was to increase the timber supply of the Les Escoumins and Forestville management units, thereby enhancing the economic impact of forestry on the Upper North Shore.

Spending under the Agreement totalled $12.3 million, distributed as follows: $11.6 million allotted to the forest management program and $647 600 to the management, communications and evaluation program.

The Agreement's operational objectives comprised silvicultural treatments on 14 530 hectares of land, with emphasis on tending of natural and artificial regeneration and bringing poorly regenerated sites back into production.

In all, 10 560 hectares were treated, or an area equivalent to more than half the size of Île d'Orléans. This work represented 73% of the silviculture objectives and used up 95% of the $12.2 million budget initially earmarked for the forest management program. This divergence is mainly attributable to the following three factors:

- incomplete knowledge of the work to be done (nature of work, land areas, and operational constraints) when the objectives were set;
- underestimation of operational follow-up and administrative costs for the work;
- shortage of skilled labour during the first few years of the Agreement.

Above all, the management, communications and evaluation program enabled the Canadian Forest Service to assume its responsibilities in managing and evaluating the

Agreement. Program implementation came under the guidance of the Agreement management committee and the evaluation subcommittee.

The economic effects of the Agreement are associated with implementation of the programs and processing of the timber volumes made available by the activities of the Agreement. The effects were evaluated from the standpoint of both Quebec society and public finances. The overall impact includes direct, indirect and induced effects.

The evaluation procedure made it possible to measure most of the economic effects in Quebec. Here are a few highlights:

- Implementation of the programs generated more than 640 direct jobs lasting an average of 20 weeks (or 240 person-years). This employment represents a total payroll of $7.4 million.

- When indirect and induced employment are factored in, the overall impact of implementation amounts to 340 person-years and a payroll of $10.1 million.

- Silvicultural operations under the Agreement increase timber supply by 439 600 cubic metres, 32% over the short term (allowable cut effect) and 68% over the long term.

- Total employment (direct, indirect and induced) related to processing this additional timber volume amounts to 1 420 person-years, for a total payroll of $50.6 million.

- In terms of added value, the impact of implementation and processing activities totals $105.1 million.

- The gains to Quebec society from social gains from employment, timber resource rent and earnings in foreign currencies on exported products amount to $14.4 million.

- The governments of Quebec and Canada make $35.6 million in financial gains through fiscal and parafiscal benefits and stumpage fees.

- Both levels of government also benefit from budget savings of about $3.4 million on social assistance and unemployment insurance.

- The Agreement generated several positive externalities. These included participation in the new direction for silviculture as reflected in the province's forest protection strategy, development of regional expertise in silviculture, improved working conditions for forestry personnel, and enhanced public awareness of regional forest management issues on the Upper North Shore. A few negative environmental externalities were also noted.

The above assessments show that approximately 85% of the economic benefits are associated with processing of harvestable timber volumes and 15% with implementation of the programs. About 40% of the impact arises in the short term and 60% in the long term.

On the whole, the economic effects appear to be substantial and in keeping with the Agreement's objectives.

INTRODUCTION

The forest sector holds a predominant position in the economy of the Upper North Shore. An estimated 50% of the region's employment depends on forestry either directly or indirectly. The sector's contribution to the Upper North Shore's economy is especially significant given that the region's unemployment rate is well above the provincial average.

To promote the viability and competitiveness of the region's forest industry, on December 22, 1987, the governments of Canada and Quebec signed the Special Subsidiary Agreement (1987-1992) on Forest Development of the Upper North Shore. This agreement, implemented under the Economic and Regional Development Agreement (1984-1994), had a $12.3 million budget and ended in fiscal year 1992-1993[1].

In May 1990 and March 1992, the Agreement management committee published two progress reports presenting the status of Agreement programs and activities. The present report describes the Agreement's achievements and economic benefits in relation to its objectives.

The report consists of four parts. The first part gives an overview of the Agreement, focusing on the issues and context in the forestry sector which gave rise to the Agreement's objectives and programs. The terms and conditions of funding and implementation are also presented. The second part of the report outlines the cumulative achievements of the programs and activities. This information allows the measurement of the extent to which the Agreement reached its operational objectives.

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1 Although scheduled to run for five years, the Agreement contained provisions allowing activities to be conducted during the sixth year, i.e., 1992-1993.

The third part of the report evaluates the economic effects arising from the Agreement. This evaluation was made using the framework that the Agreement's evaluation subcommittee drew up in January 1990. The economic effects were evaluated in order to assess how successful the Agreement was in attaining its overall objectives. The conclusions are set out in the fourth part of this final report.

1. OVERVIEW OF THE AGREEMENT

1.1 Forest Management Issues and Context

The Special Subsidiary Agreement on Forest Development of the Upper North Shore was drawn up in 1987. At the time, the Upper North Shore's forest sector had seven main characteristics:

1) predominance of public (Crown) forests lying within two management units: Les Escoumins (091) and Forestville (092);
2) a potential timber shortage anticipated in the medium and long term, notably due to the impact of the latest spruce budworm epidemic;
3) a northward shift in felling areas causing an increase in supply costs;
4) silvicultural activities aligned with the Canada-Quebec Subsidiary Agreement on Forest Development (1985-1990) and mainly geared to reforestation;
5) under-utilization of natural regeneration potential owing to insufficient tending (cleaning and spacing) of this type of regeneration;
6) the need to tend existing plantations;
7) the advent of Quebec's new forest policy, which assigned responsibility to the ministère de l'Énergie et des Ressources du Québec (MERQ, Quebec Department of Energy and Resources)[2] for restoring insufficiently restocked areas (backlog) to productivity.

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2 On February 1, 1991, the "forestry" section of the MERQ became the ministère des Forêts du Québec (Quebec Department of Forestry), which, on January 11, 1994, was merged with the new ministère des Ressources naturelles du Québec (Quebec Department of Natural Resources). For the purposes of this report, the designation ministère des Ressources naturelles du Québec (MRN) will be used hereinafter.

1.2 Objectives

The Agreement objectives were designed specifically to address the forestry problems of the Upper North Shore, and included overall socioeconomic objectives, a specific objective centred on timber supply, and operational objectives pertaining to silviculture. The operational objectives were aimed at supporting the specific objective, which in turn contributed to the attainment of the overall objectives.

Overall Objectives

- Spur economic development.
- Boost employment and revenue generation opportunities.

Specific Objective

- Increase timber supplies from the Les Escoumins and Forestville management units so as to foster the long-term viability and competitiveness of the region's forest industry.

Operational Objectives

- Take an inventory on 100 000 hectares of land in order to plan the silvicultural activities under the Agreement.
- Tend 8 000 hectares of natural regeneration.
- Tend 3 500 hectares of plantations.
- Eliminate 2 680 hectares of unwanted stands through conversion cutting with a view to subsequent replanting.
- Carry out site preparation activities on 350 hectares to be reforested.

1.3 Programming

In light of the above objectives, the budget envelope of $13 million was divided between two distinct programs: a forest management program and a management, communications and evaluation program. Table 1 compares initial budget programming and actual expenditures. The expenditures reflect funding reallocations approved by the Agreement management committee. Spending totalled $12.3 million, or 94% of the initial envelope.

Table 1. Initial Programming and Actual Expenditures

Programs and Activities	Initial Programming ($'000s)	Actual Expenditures ($'000s)	(%)
1. FOREST MANAGEMENT			
1.1 Preparatory and related work	2 700.0	3 523.4	130
1.2 Site preparation and stand conversion	2 200.0	1 591.7	72
1.3 Regeneration tending	7 300.0	6 503.3	89
Sub-total	**12 200.0**	**11 618.4**	**95**
2. MANAGEMENT, COMMUNICATIONS AND EVALUATION	**800.0**	**647.6**	**81**
TOTAL	**13 000.0**	**12 266.0**	**94**

Forest Management Program

Funding of $11.6 million was allocated to the forest management program. This program comprised three activities, two of which encompassed the silvicultural work provided for under the Agreement:

1) *"Preparatory and Related Work"* mainly dealt with administering forest management activities, inventory work, road improvement, and purchase of equipment. $3.5 million was allotted to this activity.

2) *"Site Preparation and Stand Conversion"* corresponded to preparatory treatments for restoring insufficiently restocked sites to productivity. This component had a $1.6 million budget.

3) *"Regeneration Tending"*, the main component of the management program, covered tending of natural and artificial regeneration. Expenditures totalled $6.5 million.

Management, Communications and Evaluation Program

This program had a $647 600 budget and three main components:

1) *"Management"* corresponded to the organizational structure established by the federal government to assume its responsibilities for managing the Agreement.

2) *"Communications"* was aimed at informing forestry stakeholders and the general public about Agreement activities.

3) *"Evaluation"* dealt with assessing the Agreement's economic benefits, the results of which are presented in Section 3.

1.4 Implementation and Funding

A management committee was mandated to administer the activities of the Special Subsidiary Agreement on the Upper North Shore. This committee was composed of an equal number of representatives from the federal and provincial governments. Its members met 16 times, notably to agree on annual budget programming and review progress in relation to the Agreement's objectives.

Responsibility for implementing the forest management program rested with the ministère des Ressources naturelles du Québec (MRN). In its role as implementation agent, the Crown corporation REXFOR awarded contracts and did operational follow-up of the silvicultural work, which was mostly contracted out. The procedure for awarding the silviculture contracts gave priority to local forestry organizations.

Overall, the Agreement was funded equally by the two signatory governments (49.6% by the federal government and 50.4% by the Quebec government). However, a sum of $1.3 million, constituting part of the forest management program budget, was funded directly by the Quebec government. This sum represented the MRN's internal expenditures associated with administering the forest management program. The federal government, for its part, directly funded the budget for the management, communications and evaluation program, for which it assumed responsibility for implementation. The federal government also provided most of the funding for the work related to tending regenerated areas under the forest management program. Table 5 of Appendix A gives a detailed breakdown of the funding the two governments allocated to the Agreement programs and activities.

2. OVERVIEW OF ACHIEVEMENTS

This section presents the final achievements of the Special Subsidiary Agreement for the Upper North Shore. These are shown in Table 2 in terms of work done and costs incurred. More detailed information is presented in Tables 6 and 7 in Appendix B, specifically, the annual achievements and jointly funded actitivies by management unit.

2.1 Forest Management Program

Expenditures under the forest management program amounted to $11.6 million, or nearly 95% of the Agreement's total budget. About 67% of this sum went toward work within the Les Escoumins unit and 33% to the Forestville unit.

2.1.1 Preparatory and Related Work

Among the preparatory and related work (Activity 1.1) are two types of forestry operations, i.e., silvicultural inventory and road work, and special training projects. Those activities are described below.

Silvicultural Inventory

Forestry operations under the Agreement began in 1987 with an inventory conducted on 6 500 hectares in order to plan the silvicultural activities of the forest management program. Inventory work continued over the next 4 years, covering a total area of 52 680 hectares. While this inventoried area represented 53% of the initial objective of 100 000 hectares, it proved sufficient for selecting sites for silvicultural treatments under the Agreement.

Table 2. Summary of Achievements

PROGRAMS AND ACTIVITIES	OPERATIONS	EXPENDITURES ($'000s)
1. FOREST MANAGEMENT		
1.1 Preparatory and Related Work		
Administration - Quebec financing	n/a	1 339,8
Administration - joint financing	n/a	821,9
Silvicultural inventory	52 680 ha	406,7
Road work	475 km	652,1
Vehicles	n/a	103,7
Operational follow-up	n/a	89,8
Other	n/a	109,4
Sub-total [a]	**n/a**	**3 523,4**
1.2 Site Preparation and Stand Conversion		
Site preparation	269 ha	176,6
Stand conversion	1 437 ha	1 187,3
Operational follow-up	n/a	227,8
Sub-total	**1 706 ha**	**1 591,7**
1.3 Regeneration Tending		
Plantation tending	1 388 ha	466,2
Natural regeneration tending	7 359 ha [b]	4 753,2 [c]
Pest control work	108 ha	44,9
Operational follow-up	n/a	1 239,0
Sub-total	**8 855 ha**	**6 503,3**
Forest management sub-total [a]	**10 561 ha**	**11 618,4**
2. MANAGEMENT, COMMUNICATIONS AND EVALUATION		
Federal financing	**n/a**	**647,6**
TOTAL [a]	**10 561 ha**	**12 266,0**

[a] Surface area totals do not include forest inventory.

[b] This area includes 47 hectares tended in a training project under the sub-activity "Administration - Quebec financing".

[c] This expenditure includes $71 909 in training costs.

Road Work

The road work done under the forest management program was aimed at providing access to sites targeted for silvicultural treatments under the Agreement. To this end, a total of 475 kilometres of roads were maintained or improved.

Training Projects

A shortage of skilled labour slowed down initial silvicultural work under the forest management program. To alleviate this problem, and at the request of the region's stakeholders, the Agreement managers authorized funding in 1988-1989 for an initial training project for forest workers. The courses lasted three weeks and were given by the forestry training centre of the Bersimis School Board, for the Forestville region, and by CERFO, a forestry education and research centre based in Sainte-Foy, for the Les Escoumins region. Under this first project, 28 people received training on natural regeneration tending.

During fiscal years 1990-1991 and 1991-1992, two other similar projects were carried out in partnership with the Crown corporation REXFOR, Employment and Immigration Canada[3], and the forestry training centre of the Bersimis School Board. These courses included 4 weeks of theory and 12 weeks of practical training. Together, the three series of courses served to train more than 50 people, most of whom went on to silviculture-related employment.

The training projects incurred $369 300 in expenditures, $231 600 of which was covered by the Agreement[4] and $137 700 by Employment and Immigration Canada.

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[3] This department is now part of Human Resources Development Canada.

[4] Training expenditures for fiscal years 1990-1991 and 1991-1992 were charged to Activity 1.1 of the Agreement and those for fiscal year 1988-1989 to Activity 1.3.

2.1.2 Silvicultural Operations

As part of the silvicultural operations under the forest management program (Activities 1.2 and 1.3 in Table 2), 10 560 hectares were treated, or 73% of the initial objective of 14 530 hectares. Figure 1 shows to what extent the 5 year target was reached for each of the five types of silvicultural work planned under the forest management program.

Analysis of the results reveals the following:

- The main operational objective of the Agreement, namely that related to natural regeneration tending, was almost completely attained, at 92%.

- Only 54% of the stand conversion target was achieved, owing to the reduction in related operational objectives. MRN managers re-evaluated the need for some of the conversion cutting in light of the province's proposed forest protection strategy. This strategy, adopted in 1994, advocates silvicultural techniques that are more respectful of the natural dynamics of the forest environment.

- Although only 40% of the plantation tending objective was reached, the vast majority of plantations that needed cleaning were treated. Plantation tending under the Agreement was completed by the MRN as part of its regular program and job creation programs.

Attaining 73% of the silvicultural objectives under the forest management program used up 95% of the budget initially earmarked for this program. This divergence is mainly attributable to the following three factors:

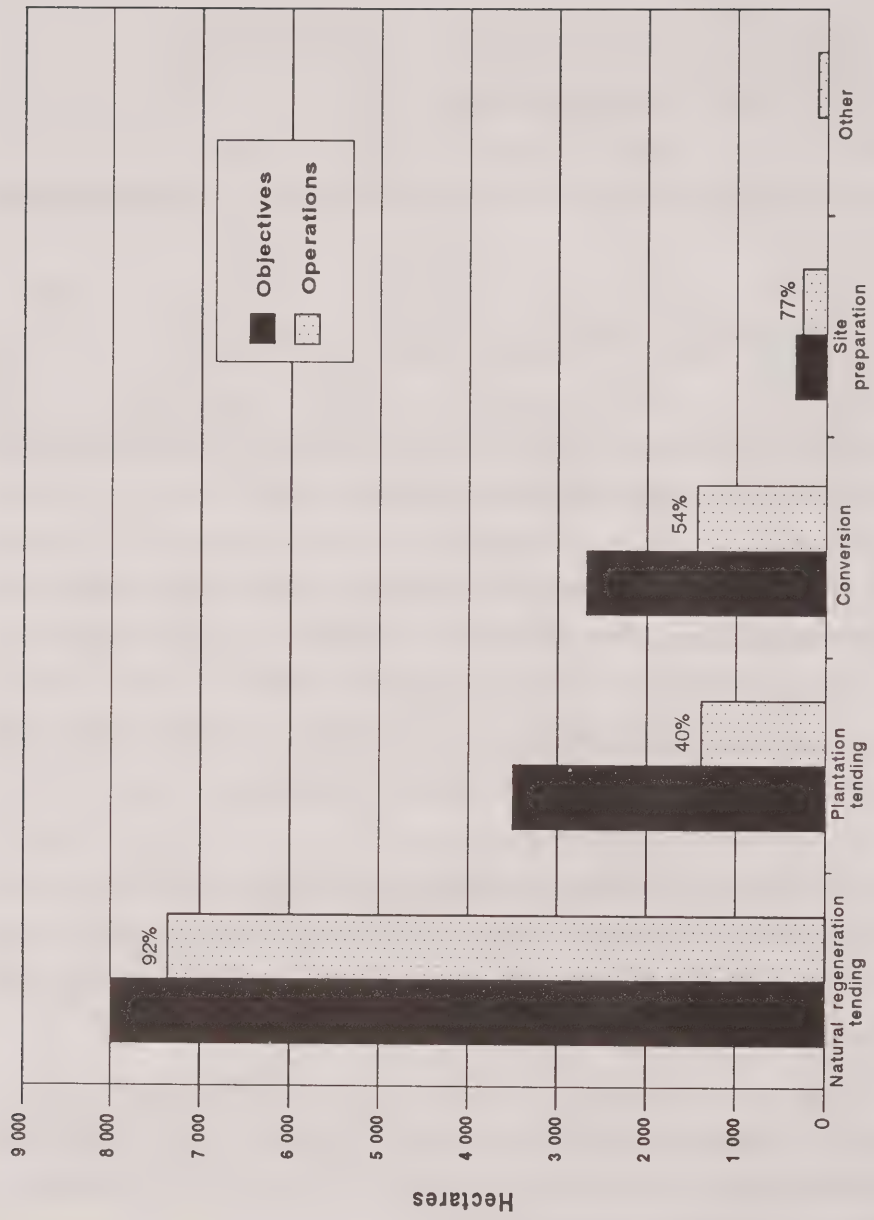

Figure 1. Silvicultural Operations Compared with Initial Objectives.

- incomplete knowledge of the work to be done (nature of work, land areas, and operational constraints) when the objectives were set. This was the reason for the inventory work included in Activity 1.1;

- underestimation of operational follow-up and administrative costs for the work;

- shortage of skilled labour during the first few years of the Agreement, which led to the provision of training under the Agreement.

2.2 Management, Communications and Evaluation Program

Expenditures under this program amounted to $647 600, with most of this amount covering Canadian Forest Service[5] activities related to managing and evaluating the Agreement. These activities included analysing jointly funded activities, managing federal contributions and cash flow, monitoring forestry issues on the Upper North Shore, and producing the Agreement's 1987-1990 and 1990-1991 progress reports.

In addition, the evaluation framework for the Agreement and this final report were produced jointly by the Canadian Forest Service and the ministère des Ressources naturelles du Québec. The evaluation framework defines the criteria and methodology for measuring the Agreement's economic effects.

In 1988 and 1989, the program also funded the establishment of 140 semi-permanent sample plots in the Les Escoumins and Forestville units. This experimental project, which cost $84 300, was aimed at evaluating the medium-term effects of natural regeneration tending under the Agreement. In 1995, the first sample-plot

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5 Became a department, Forestry Canada, from February 1990 to June 1993.

remeasurement was being completed. The preliminary results of the project will be known by the year 2000.

A sum of $3 400 was used for two special communication activities in June 1990. The first activity consisted of a site visit to the Les Escoumins management unit, during which some 50 people, mostly regional forestry stakeholders and socioeconomic representatives, had the opportunity to familiarize themselves with Agreement activities.

The second communication activity was an "open house" day for the general public at the Les Escoumins management unit offices. Participants had the opportunity to view displays on Agreement activities and talk with resource people from the ministère des Ressources naturelles du Québec and the Canadian Forest Service.

3. ECONOMIC EFFECTS

Pursuant to Article 6.5 of the Agreement, a quantitative assessment had to be prepared on the economic effects of the Agreement on both Quebec society and public finances. These effects are associated with program implementation and with processing of the timber volumes resulting from Agreement operations.

The evaluation procedure is thus concerned with the overall economic objectives mentioned in Section 1. The evaluation does not entail a profitability analysis using criteria such as present net worth, cost-benefit ratio or internal rate of return. Instead, it is an appraisal of the costs and the benefits generated by Agreement programs.

Section 3.1 describes the model used to evaluate the impact of the Agreement. The socioeconomic and financial effects are discussed in Section 3.2.

3.1 Impact Evaluation Model

The model used to evaluate the economic impact of the Agreement will be examined briefly based on the evaluation criteria, the underlying concepts, the methodological approach, and the limitations of the evaluation.

3.1.1 List of Criteria

a) Socioeconomic Effects

- Direct, indirect and induced employment (person-years and jobs):
  - related to implementation of Agreement activities;
  - related to processing of additional timber supplies resulting from Agreement operations.

- Before-tax salaries and wages for each of the three effect categories (direct, indirect and induced).

  Value added at factor cost, by effect category.

b) Social Gains

- Social gains from employment, by effect category.
- Resource rent from harvestable timber supplies.
- Earnings in foreign currencies on exports of timber-derived products.
- Positive/negative externalities.

c) Financial Gains for Governments

- Financial gains for the two levels of government for each effect category (direct, indirect and induced):
  - fiscal and parafiscal benefits;
  - stumpage fees payable in cash.
- Budget savings on unemployment insurance and social assistance benefits.

3.1.2 Definition of Concepts

Timber Supplies Made Available

This concept corresponds to the additional timber volumes that can be harvested as a result of Agreement operations. Part of the overall volume increase is available in the short term, since the forest structure permits an allowable cut effect. Timber supply also becomes available over the long term, that is, when the treated areas start producing mature wood.

Direct Effects

According to the *Bureau de la statistique du Québec* (B.S.Q., 1986), "direct effects denote salary expenditures and other gross revenues in sectors that meet initial demand". With regard to the Agreement, direct employment corresponds to the workers who carry out Agreement activities and those who process the additional timber arising therefrom.

Indirect Effects

According to the B.S.Q. (1986), "indirect effects are the effects that impinge on all suppliers in producing sectors, their suppliers and so on". The "upstream effects" of the activities are thus measured under this heading. With regard to the Agreement, indirect employment encompasses workers who produce the machines, instruments, supplies, etc. required for the activities, along with those who supply the raw materials and goods and services needed to process additional timber supplies.

Induced Effects

Induced effects result from increased household spending and public and parapublic expenditures. For example, direct and indirect employment generated by the Agreement boosts incomes for the people holding these jobs, who therefore consume more goods and services. The additional workers required to supply these goods and services represent an induced effect.

Value Added at Factor Cost

"The value added at factor cost is a measure of the value of domestic production in the Quebec economy. In the B.S.Q. input-output econometric model, it is calculated

by adding up all the remuneration associated with factors of production, i.e., before-tax salaries and wages and other before-tax gross revenues. This production concept corresponds to gross domestic product at factor cost used elsewhere in Quebec's economic accounting system" (B.S.Q., 1994).

Social Gains from Employment

This variable, which relates to salaries and wages, represents the excess in the earnings of people holding jobs generated by the Agreement over what they would have obtained in the Quebec economy (opportunity cost) if the Agreement had not been implemented. The social gains from full-time employment are estimated separately for each employment category based on such variables as the probability of working during a given year, total payroll and the value of leisure time, or more specifically, the value of free time outside work hours. By contrast, the social gains associated with seasonal employment are estimated on the basis of assumptions about income from all sources (work, unemployment insurance and social assistance), with or without Agreement activities.

It should be noted that calculation of the social gains from employment makes explicit allowance for opportunity cost, i.e., benefits foregone when working on a project. For this reason, social gains from employment and salaries and wages are two different types of variables that cannot be added together.

Forest Resource Rent

This concept refers to the value society attaches to the timber supply, "a rare resource that offers potential for meeting commercial needs. This rent can be calculated by subtracting the entrepreneur's operating costs and profit margin from the market value

of the timber" (Richard, 1992). The forest resource rent, or stumpage value, thus amounts to the excess of earnings over marketing costs (Luckert and Bernard, 1991).

With regard to the Agreement, the forest resource rent corresponds to the additional timber volumes made available by forest management operations, multiplied by the unit stumpage value.

Earnings in Foreign Currencies

These are the gains to Quebec society resulting from forest product exports made possible by the increased timber supply (Éconosult, 1984).

These gains differ from the market value of foreign currency earnings, given that international trade is affected by distortions, notably tariff barriers and import quotas. Jenkins and Kuo (1985) estimated that for every dollar worth of Canadian exports, the additional gain to Canadian society was $0.066 or 6.6%. Under the North American Free Trade Agreement, these distortions have been reduced. According to Professor Fernand Martin (1993), an expert in cost-benefit analysis, a more realistic estimate of this premium would be 4% at present. A 4% premium on foreign exchange will therefore be used to estimate the social value of the foreign currencies accruing to Quebec as a result of the Agreement's implementation.

Externalities

In the current context, externalities refer to effects that are not directly associated with the Agreement objectives and are not captured by other evaluation criteria. Externalities can be positive or negative and include soil protection, pollutant emissions, the establishment of silviculture corporations, and so on.

Financial Gains for Governments

For the federal and Quebec governments, these gains consist of taxes paid by workers, parafiscal payments by both workers and companies (pension plans, Quebec occupational health and safety board, health insurance board, labour commission, unemployment insurance) and sales taxes and specific taxes. As regards financial gains due to increased timber supply, the following can be included: corporate tax (for the sawmill and pulp and paper industries) and stumpage fees payable in cash.

Budget Savings by Governments

These are the budget savings the federal and provincial governments realize on unemployment insurance and social assistance. For full-time jobs, these savings are estimated based on such variables as average benefits paid out in unemployment insurance and social assistance, the probability of receiving these benefits, and employment created by investments under the Agreement. In the case of seasonal jobs, these savings are calculated based on various assumptions made about unemployment insurance and social assistance that are specific to different employment categories.

3.1.3 Methodology and Main Steps[6]

Methodology

This evaluation procedure centres on the input-output econometric model of the *Bureau de la statistique du Québec* (B.S.Q.). Based on a table describing exchanges

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[6] The description of the methodology is taken almost word for word from Appendix 1 of the Forest Protection Strategy (Gouvernement du Québec, 1994).

of goods and services among all of Quebec's economic sectors, the model can be used to determine how the effects of an expenditure are distributed, for example, in terms of the labour force, salaries, added value and fiscal, parafiscal and taxation revenues for both governments. This information can be evaluated as direct and indirect effects.

By applying the B.S.Q. model to Agreement expenditures connected with timber processing, it is possible to measure how this spending affects other economic sectors.

The B.S.Q. model does not show the induced effects of a project. However, the salary figure obtained for direct and indirect employment from an initial simulation can be used to estimate how much disposable income the workers will have. A second simulation can then be performed to determine the impact of this "respent" income by assuming that its structure will be identical to the average pattern of consumer spending by Quebec households as used in the model. This procedure was employed to evaluate the induced effects of the Agreement.

The B.S.Q. model measures labour force in person-years, i.e., the average number of hours a person would work during an entire year in a given sector of activity. Because silvicultural activities are largely carried out by seasonal workers, if the B.S.Q. model were used without making any adjustments, the fiscal and parafiscal values obtained for those workers would be skewed. Consequently, assumptions had to be made about the workers' other sources of income and also the duration of jobs resulting directly from the Agreement. A model developed by the MRN can be used to incorporate both the data from the B.S.Q. model and the assumptions about seasonal workers in order to calculate the economic spinoffs from forestry work.

In addition, the MRN model can be used to compare, for each activity generated by the Agreement, the amount of social assistance and unemployment insurance benefits that would have been paid out if the Agreement were carried out and if it were not. Two approaches are used, depending on whether the work force is permanent or seasonal:

- For permanent employment (direct, indirect and induced person-years), the level of benefits is estimated from data on the average periods of employment, unemployment and social assistance in Quebec. Each permanent job gives rise to savings equal to the average annual benefits the worker would have received if the Agreement had not existed, taking into account the probability of the worker ending up unemployed or on welfare.

- For seasonal employment, expressed in terms of the number of jobs, the impact on benefits is estimated directly by multiplying the average weekly benefits by the number of weeks the worker is eligible to receive them, taking into account the assumptions about duration of employment and other sources of income. In general, it is assumed that seasonal workers were receiving social assistance benefits before the Agreement got under way.

Finally, social assistance benefits are divided between the federal and provincial governments, in accordance with the terms and conditions of cost sharing set out in the Canada Assistance Plan.

It should be noted that the method used here is essentially one of marginal changes. In fact, the only changes measured are those attributable to Agreement achievements. In addition, the methodology is aimed at measuring the overall impact of the work done, i.e., direct, indirect and induced effects.

Main Steps in the Methodology

The main steps in calculating the socioeconomic and financial effects and the social gains attributable to the Agreement are shown in Figure 2. They can be summarized as follows:

- Compile achievements of the Agreement by program and activity.

- On the basis of forest management achievements, calculate the impact of the activities on the timber supply and estimate when the additional timber volumes will be harvested.

- Calculate the labour force (direct, indirect and induced) connected with implementation of Agreement activities and processing of increased timber supplies.

- On the basis of the impact on the labour force, calculate the effect on before-tax salaries and wages for each employment category.

- On the basis of the impact on salaries and wages, calculate the added value and social gains from employment arising from Agreement activities and processing of additional timber supplies.

- On the basis of additional timber supplies, estimate the resource rent and earnings in foreign currencies on exported products.

- Provide a qualitative description of the externalities associated with Agreement activities.

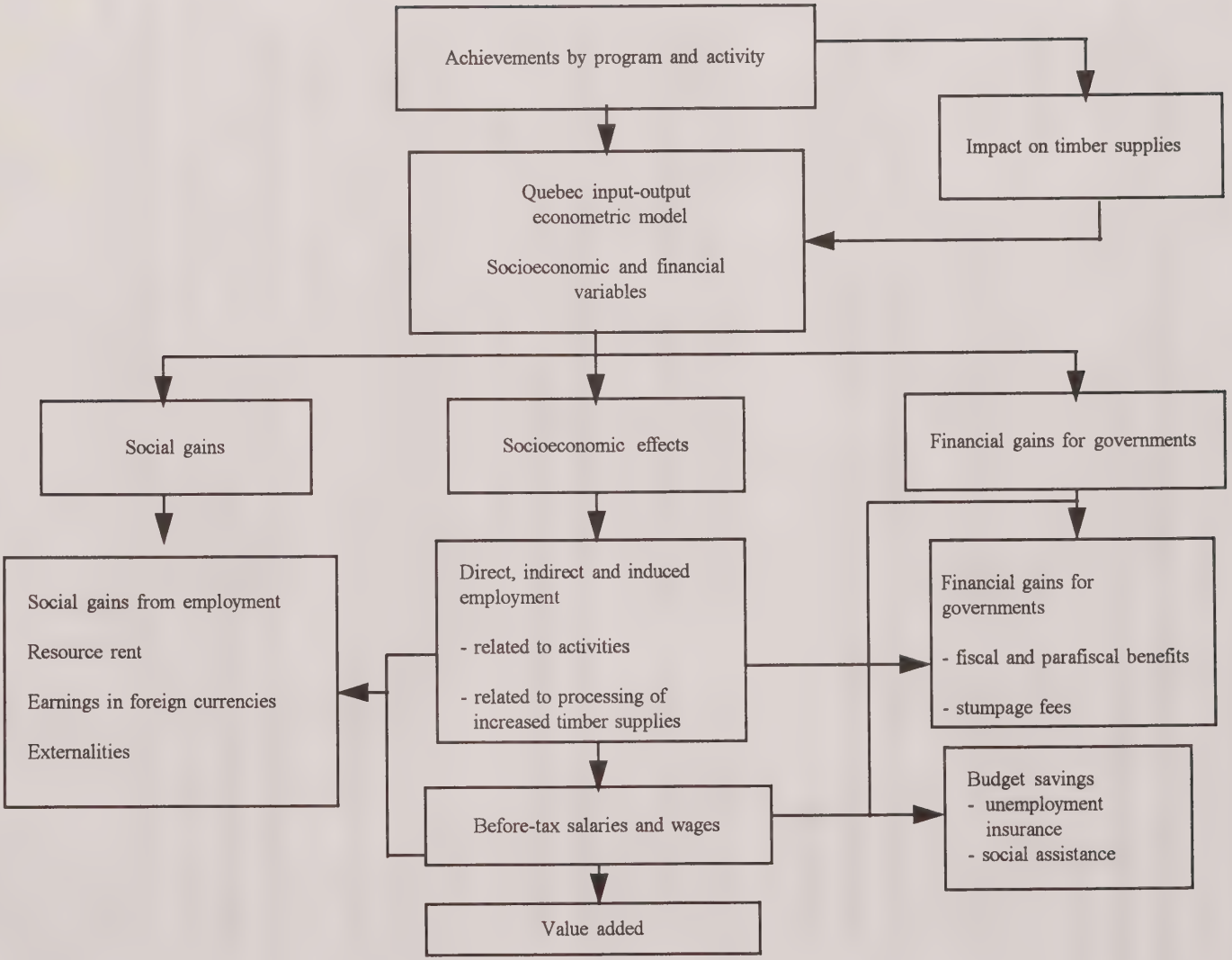

Figure 2. Main Steps in the Methodology.

- Based on the impact on employment, on before-tax salaries and wages and on processed timber supplies, calculate the fiscal and parafiscal benefits (including indirect taxes and stumpage fees payable in cash) to the federal and provincial governments.

- Finally, on the basis of employment impact, calculate the budget savings that the two levels of government will realize on unemployment insurance and social insurance benefits.

3.1.4 Limitations of the Model

The evaluation criteria and methodology overlook some of the impacts of the Agreement on the Quebec economy. These are mainly "downstream effects" related primarily to timber-supply processing. No allowance is made for jobs associated with transporting finished products to international markets (exports of lumber, commercial pulp, paper, etc.) or with finished product processing in Quebec (e.g., furniture manufacturing).

Because the model evaluates the effects generated in Quebec, it ignores the spinoffs from the Agreement in other Canadian provinces and the related impact on federal coffers of these benefits arising outside Quebec. These spinoffs are attributable to processing of timber imports from Quebec and to purchases from other Canadian provinces of goods and services needed for Agreement activities and to processing of additional timber supplies.

Because the model is on a provincial level, effects cannot be estimated for each administrative region; hence, the Agreement's specific impact on the Upper North Shore region cannot be determined. Nonetheless, some of the input data used with

the model were adjusted to reflect conditions on the Upper North Shore. These parameters include average salaries, duration of employment, eligibility criteria for unemployment insurance, stumpage fees and the initial destination for wood products (lumber, pulp and paper).

It should also be noted that many assumptions are used in calculating economic spinoffs. These assumptions relate to the results of silvicultural work, the increase in timber supplies, the adjustment mechanisms of the job market, and supply and demand trends for forest products in Quebec. In this regard, the study implicitly assumes that the plantations established following site preparation and stand conversion operations under the Agreement will receive tending aimed at promoting normal growth, and that all additional timber volumes will be harvested and processed.

3.2 Estimation of Agreement Effects

The evaluation of socioeconomic and financial effects is based on the Agreement achievements, as described in Section 2. Given the complexity of the model used and the volume of data processed, only the main points of this evaluation will be presented here.

3.2.1 Estimation of the Increase in Timber Supply

The first step in calculating spinoffs involves estimating the increase in timber supply generated by Agreement operations. This increase is attributable to natural regeneration tending and activities associated with reforestation.

The evaluation of this aspect rests on three main assumptions:

Assumption 1: Because the Agreement includes no planting work, the plantations attributable to Agreement operations are evaluated using a cost proportionality approach. First, the proportion of the total cost of plantation establishment and tending associated with the Agreement reforestation work (site preparation, stand conversion and plantation tending) has to be estimated. This proportion is then multiplied by the surface area of site preparation work done under the Agreement. The result represents the overall plantation area attributable to the Agreement.

Assumption 2: The impact of the work on timber supplies is divided between the short-term (allowable cut effect) and long-term increase. The latter is determined from the additional yields of treated areas.

Assumption 3: The timber supply increase attributable to Agreement activities is unaffected by the modifications made to the territorial boundaries of the Les Escoumins and Forestville management units since the Agreement got under way. Therefore, the allowable cut effect generated by Agreement operations was estimated on the basis of the conditions that existed before the boundaries were modified.

Silviculture Operation Area Affecting Timber Supply

The MRN, North Shore Region has estimated the total plantation area attributable to the Agreement by using the cost-proportionality approach (assumption 1)[7]. This agency first determined that site preparation, stand conversion, and plantation tending accounted for about 70% of the total cost of plantation establishment and tending.

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7 This estimate was calculated on the basis of provisional results. This should not have a significant effect on the results of the estimate.

Using this figure, it then calculated that 1 156 hectares of plantations are attributable to the Agreement reforestation work.

In addition, 7 359 hectares of natural regeneration were tended under the Agreement. However, 390 hectares of this total were destroyed by a forest fire in 1991, thus reducing natural regeneration tending to 6 969 hectares.

Thus, the silvicultural work generating a timber supply increase totals 8 125 hectares, including nearly 7 000 hectares of natural regeneration tending.

Short-term Increase

The MRN's regional office used the SYLVA software package to estimate the allowable cut effect attributable to Agreement operations. First, the allowable cut for the territories of the Les Escoumins and Forestville management units was estimated by excluding the silviculture operation areas attributable to the Agreement[8]. The result was then compared with the allowable cut specified in the forest management and supply agreements (CAAF, contrats d'aménagement et d'approvisionnement forestier). The difference represents the allowable cut effect generated by the silvicultural activities. This effect amounts to 27 850 cubic metres per year, or 139 250 cubic metres for the 5 years of silvicultural work under the Agreement.

Long-term Increase

The long-term increase in timber supply is computed based on the additional yield associated with treated areas (Assumption 2), which corresponds to the difference

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8 This estimate was calculated on the basis of the overall plantation area attributable to the Agreement (1 156 hectares) and interim data for precommercial thinning (6 703 hectares), i.e., 96% of actual results).

between the current annual increase with treatment and the current annual increase without treatment. This additional yield was estimated at 115 cubic metres per hectare at the 55-year mark for tended artificial regeneration and 44 cubic metres at the 55-year mark for tended natural regeneration[9]. These values were then multiplied by the surface area of the treated sites to obtain a total timber supply increase of 439 576 cubic metres (87 915 cubic metres per year). Finally, the short-term timber supply increase was subtracted from this figure. The resulting total of 300 300 cubic metres (66 070 cubic metres per year) represents the long-term net timber supply increase under the Agreement.

Thus, the total timber supply increase attributable to the Agreement is estimated to be about 439 600 cubic metres, with 68% of this total arising over the long term and 32% over the short term.

3.2.2 Assumptions about the Forestry Labour Force

As already noted, the methodology for evaluating spinoffs entails certain assumptions about the seasonal nature of employment in forestry. These assumptions are listed in Table 3. For each employment category, they describe the different sources of annual income with or without Agreement operations. Alternative sources of income may include unemployment insurance, social assistance or any other paid work.

Two major types of forestry operations were identified for evaluation purposes. The first type encompasses all silvicultural operations carried out under the Agreement. The second type covers the workers who harvest or will harvest timber arising from those silvicultural operations.

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9 The figures were calculated as follows: *i)* 3.27 m^3/ha per year (180 m^3/ha at 55 years) for tended artificial regeneration, minus 1.19 m^3/ha per year (95 m^3/ha at 80 years) for second-growth natural forest, multiplied by 55 years; *ii)* 3.27 m^3/ha per year (180 m^3/ha at 55 years) for tended natural regeneration, minus 2.48 m^3/ha per year (124 m^3/ha at 50 years) for second-growth forest, multiplied by 55 years.

Table 3. Assumptions about the Forestry Labour Force

(constant August 1995 dollars)

CATEGORY OF WORKERS			DURATION OF ANNUAL INCOME SOURCES (days)						
			With Agreement				Without Agreement [a]		
Status	Proportion	Salary ($/day)	Agreemt. work	Other jobs	Unemplmt. insurance [b]	Social assistance	Other jobs	Unemplmt. insurance [b]	Social assistance
Agreement Silvicultural Work									
Full time	10%	197	260	0	0	0	172	26	12
Seasonal	20%	118	130	40	80	0	100	150	0
Seasonal	35%	92	80	20	150	0	60	140	50
Seasonal	35%	92	80	20	150	0	0	0	260
Timber Harvesting									
Full time	5%	197	260	0	0	0	172	26	12
Seasonal	29%	142	260	0	0	0	260	0	0
Seasonal	29%	142	260	0	0	0	0	0	260
Seasonal	37%	142	180	0	170	0	0	0	260

[a] Without the Agreement, the duration of income sources for full-time workers is estimated based on the average values for region 09.

[b] For unemployment insurance, the waiting period of two weeks is deducted, leaving a maximum of 250 days of annual income for recipients.

3.2.3 Estimation of Economic Effects

The Upper North Shore Agreement incurred expenditures of $12.3 million ($13.7 million in constant August 1995 dollars). These expenditures have generated or will generate various socioeconomic impacts and gains for Quebec society. This section evaluates these effects by presenting quantitative data and then a qualitative description of externalities.

Quantitative Data

Table 4 gives the estimates of the main effects of the Agreement. Detailed results by program and activity are presented in Table 8 of Appendix C.

Analysis of the results for the three effect categories yields the following points:

Socioeconomic Effects

- Implementation of the Agreement generated more than 640 direct jobs lasting an average of 20 weeks (or 240 person-years). More than 60% of these jobs were connected with natural regeneration tending activities.

- When indirect and induced jobs are factored in, the employment impact of Agreement activities amounts to almost 340 person-years.

- Silvicultural work made it possible to harvest and process close to an additional 140 000 m^3 of timber over a five-year period, thus generating 450 person-years of direct, indirect and induced employment.

Table 4. Estimation of the Agreement's Economic Effects

(constant August 1995 dollars)

TYPE OF EFFECTS	AGREEMENT ACTIVITIES		TIMBER PROCESSING				TOTAL	
	Short term		Short term		Long term			
	Direct	Total [a]	Direct	Total [a]	Direct	Total [a]	Direct	Total [a]
Socioeconomic								
Labour (pers-yr)	241	336	211	450	455	970	**907**	**1 755**
Jobs (pers)	642	737	211	458	455	988	**1 309**	**2 183**
Salaries and wages ($'000s)	7 426	10 054	8 629	16 028	18 608	34 565	**34 663**	**60 648**
Value added ($'000s)	10 367	15 560	14 955	28 356	32 251	61 151	**57 572**	**105 068**
Social Gains ($'000s)								
Social gains from employment [b]	1 879	2 104	1 368	2 507	2 949	5 407	**6 196**	**10 018**
Resource rent	n/a	n/a	n/a	569	n/a	1 228	**n/a**	**1 797**
Earnings in foreign currencies	n/a	n/a	n/a	818	n/a	1 765	**n/a**	**2 584**
Total	**1 879**	**2 104**	**1 368**	**3 895**	**2 949**	**8 400**	**6 196**	**14 399**
Financial for Govt. ($'000s) [b]								
Fiscal, parafiscal, stumpage fees	3 357	5 109	4 968	9 674	10 713	20 861	**19 037**	**35 644**
Budgetary savings								
- unemployment insurance	unavailable[c]	-949	unavailable[c]	335	unavailable[c]	723	**unavailable[c]**	**109**
- social assistance	unavailable[c]	1 848	unavailable[c]	465	unavailable[c]	1 002	**unavailable[c]**	**3 315**
Total	**3 357**	**6 008**	**4 968**	**10 474**	**10 713**	**22 587**	**19 037**	**39 068**
Provincial share	60%	65%	51%	54%	51%	54%	**53%**	**55%**
Federal share	40%	35%	49%	46%	49%	46%	**47%**	**45%**

[a] Aggregate of direct, indirect and induced effects.

[b] These estimates do not reflect the fiscal or social reforms that are currently being implemented or that may be implemented by governments.

[c] The impact evaluation model cannot estimate the direct effect of the Agreement on unemployment insurance and social assistance benefits.

- In the long term (in about 55 years), timber harvesting and processing activities attributable to the Agreement will create some 970 person-years, which is more than double the transformation jobs created in the short term. Note that almost all the transformation jobs are full time.

- The salaries and wages paid out during the carrying out of the Agreement activities total $7.4 million, which is more than 60% of the total expenditures under the Agreement.

- The total of the short-term effects (direct, indirect and induced) represents more than $26.1 million in salaries and wages and $43.9 million in value added. In the long term, $60.6 million in salaries and wages and $105.1 million in value added will be generated.

Social Gains

- In the short term, close to $6 million in net gains was shared by various economic players in Quebec. These gains help to boost the standard of living and enhance the economic well-being of Quebecers.

- Approximately 77% of these short-term gains accrued to nearly 1 200 workers.

- Social gains from the work force that carried out Agreement activities account for around 25% of salaries and wages paid out to the workers involved. For employment related to timber processing, the percentage is much lower, i.e., 16%. These results reflect the more difficult job situation for the silviculture labour force as compared with the labour force of the timber processing sector.

- The long-term gains to Quebec society will amount to $8.4 million.

Financial Benefits for Governments[10]

- The short-term financial gains for public coffers are in the order of $16.5 million. They include, among others, stumpage fees payable in cash, as well as fiscal and parafiscal benefits.

- About 58% of financial benefits go to the Quebec government and 42% to the federal government.

- Over the long term, financial benefits will be approximately $22.6 million.

- A $949 000 increase occurred in unemployment insurance benefits to workers related to implementation of Agreement activities (direct, indirect and induced effects). This is because a large percentage of seasonal workers became eligible for unemployment insurance after the Agreement activities ended.

Externalities

Some effects that are not directly related to the Agreement objectives or are not captured by other evaluation criteria are described below. They are termed "positive" and "negative" externalities.

Only a brief description will be given here, since externalities could not be measured easily within the scope of this study. By way of example, the impacts of silvicultural activities on the forest environment depend on interactions among many different

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10 These estimates do not take into account the fiscal and social reforms that are currently being or that may be implemented by the two levels of government.

variables, including site-specific ecological characteristics, treatments effected, technologies used, the intervention period and the areas treated.

Positive Externalities

- **Participation in the New Direction for Silviculture**

  By stressing the importance of preserving natural regeneration, the Special Subsidiary Agreement for the Upper North Shore marks the transition to a more environmentally friendly approach to forestry. As such, it has taken part in the shift to new forestry practices as embodied in the province's forest protection strategy.

- **Development of Expertise in Forestry**

  Forest managers, workers and contractors on the North Shore have greatly expanded their expertise through the Agreement activities. The silviculture inventories have assisted in better defining the needs and management constraints related to public forests in the region. In addition, special training activities and stepped-up forest management have helped to develop a skilled labour force, particularly with regard to natural regeneration tending. At the same time, the forestry co-operative "Coopérative forestière La Nord-Côtière", the Montagnais Council of Les Escoumins and some twenty private companies have consolidated or developed their forest management activities through contracts.

  As well, the project under which 140 semi-permanent sample plots were set up will provide insight into the medium-term effects of natural regeneration tending on the Upper North Shore.

- **Improved Working Conditions for Forestry Workers**

The implementation of an operational program for natural regeneration tending on the Upper North Shore diversified job opportunities for the region's forest workers. It also extended the employment period because tending of natural regeneration continues into the fall, after the planting work is completed.

- **Improved Forest Access**

Under the Agreement, $652 000 was invested to upgrade or maintain 475 kilometres of road. This work has provided better forest access for the different forest resource users on the Upper North Shore.

- **Landscape Improvement**

Silvicultural activities under the Agreement have helped to enhance the aesthetics of forest zones by reducing regeneration time or improving the vigour of advance regeneration.

- **Public Education**

Through its communication and information activities, the Agreement has helped to raise public awareness on the Upper North Shore about forestry activities, forest sector issues and forest management efforts by the two levels of government. In addition, the silvicultural work done under the Agreement serves to remind residents of the benefits of forest management.

Negative Externalities

- **Possible Deterioration of the Forest Environment**

Certain Agreement activities may have had adverse effects on the forest environment. For example, the use of phytocides or internal combustion engines (oil leakage) may be harmful to biological activity in the natural environment. Negative effects can also arise from inadequate site-preparation practices leading to soil deterioration. In addition, conversion cutting of some mixed stands with a view to replacing them with softwood monocultures (plantations) may reduce ecological diversity.

However, the reduction in the Agreement's operational objectives for stand conversion (see Section 2.1.2), development of forestry expertise, and the adoption in 1988 of the "Règlement sur les normes d'intervention dans les forêts du domaine public" (Regulation on Standards for Operations in Crown Land Forests) have helped diminish the risks of environmental degradation by Agreement activities. In addition, the small size of replanted areas compared with the natural forest limits the risk of reducing ecological diversity associated with reforestation activities.

- **Environmental Pollution**

The forest industry produces pollution in the course of processing timber made available by Agreement operations.

CONCLUSION

This report has identified the achievements and economic impact of the Special Subsidiary Agreement on Forest Development of the Upper North Shore according to the objectives initially established in this regard.

With regard to silvicultural work under the forest management program, 73% of the overall objective was attained, using 95% of the budget earmarked for this purpose. The three main factors for this divergence were identified, including the incomplete knowledge that existed when targets were set for the work to be performed.

During the implementation stage, the management, communications and evaluation program enabled the Canadian Forest Service to assume its responsibilities in managing and evaluating the Agreement. Program implementation was handled by the Agreement management committee and the evaluation subcommittee.

The specific objective of the silvicultural activities under the Agreement was to boost timber supplies from the Les Escoumins and Forestville management units. The timber supply increases anticipated from this work are estimated at nearly 440 000 cubic metres, with 32% of this total arising in the short term and 68% in the long term. Investment under the Agreement amounted to $31 (in constant August 1995 dollars) per cubic metre of timber made available in the short and long term.

With regard to economic effects, it is estimated that more than 1 750 person-years of direct, indirect and induced employment can be attributed to Agreement activities over the short and long term. Approximately 80% of this employment is connected with processing of additional timber supplies and 20% with implementation of the Agreement. The benefits arising from the Agreement in terms of salaries and wages

amount to $60.7 million. In terms of value added, the impact totals more than $105 million.

In addition, the gains to Quebec society from employment, resource rent and foreign currencies should total $14.4 million.

For their part, the federal and provincial governments will benefit from over $35.6 million in financial gains, namely fiscal and parafisal benefits and stumpage fees. The two levels of government will also benefit from budget savings of approximately $3.4 million on social assistance and unemployment insurance.

Several positive externalities were described relative to the Agreement. These include participation in the new direction for silviculture that is embodied in the province's forest protection strategy, development of expertise in silviculture among Agreement stakeholders, improved working conditions for forestry workers, and enhanced public awareness of regional forest management on the Upper North Shore. A few negative externalities related to environmental issues were also observed.

An examination of the evaluation criteria and methodology shows that this study has identified the main economic effects arising from the Agreement in Quebec. Overall, about 40% of these benefits arise in the short term and 60% in the long term. The uncertainties associated with the estimates should not significantly affect the order of magnitude of the results.

Although the silvicultural objectives were met in part, the benefits produced appear to be both significant and in keeping with the Agreement's objectives. In fact, thanks to the silvicultural work, timber supply has been increased appreciably, thus promoting the long-term viability and competitiveness of the regional forest industry. In addition, implementation of the Agreement has generated short-term benefits with an

undeniable impact on the region's economic development. It can therefore be said that the Canada-Quebec Special Subsidiary Agreement on Forest Development of the Upper North Shore has made it possible to significantly increase the economic impact of forestry on the Upper North Shore.

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APPENDIX A

DISTRIBUTION OF FUNDING ALLOCATED BY THE TWO LEVELS OF GOVERNMENT

Table 5. Distribution of Funding Allocated by the Two Levels of Government[a]

ANNEXE "C" DÉTAILLÉE

ENTENTE AUXILIAIRE SPÉCIALE CANADA–QUÉBEC SUR LE DÉVELOPPEMENT FORESTIER DE LA HAUTE CÔTE–NORD (1987–1992)

FONDS AFFECTÉS AUX PROGRAMMES (EN MILLIERS DE DOLLARS)

Révision no. 7
du 14 mars 1994

PROGRAMMES	RÉPARTITION DES DÉBOURS (000 $)				DÉBOURSÉS ANNUELS					
	BUDGET TOTAL	DÉBOURSÉS CANADA	DÉBOURSÉS QUÉBEC	FONDS NON REPORTÉS	1987–1988	1988–1989	1989–1990	1990–1991	1991–1992	1992–1993
1. AMÉNAGEMENT										
1.1 Travaux préparatoires et connexes										
– financement direct–Québec	1 400,0		1 339,8	60,2		70,5	461,2	432,7	301,9	73,5
– financement conjoint	2 300,0	1 091,8	1 091,8	116,4	72,2	462,3	705,2	428,1	407,4	108,4
SOUS–TOTAL :	3 700,0	1 091,8	2 431,6	176,6	72,2	532,8	1 166,4	860,8	709,3	181,9
1.2 Travaux préalables et conversion de peuplements	1 800,0	795,9	795,9	208,2		134,3	497,3	517,9	382,2	60,0
1.3 Entretien des aires régénérées	6 700,0	3 550,9	2 952,4	196,7		955,8	1 388,7	1 976,6 (1)	1 704,4 (2)	477,8 (3)
TOTAL AMÉNAGEMENT :	12 200,0	5 438,6	6 179,9	581,5	72,2	1 622,9	3 052,4	3 355,3	2 795,9	719,7
2. GESTION, COMMUNICATIONS ÉVALUATION	800,0	647,5		152,5		127,0	132,1	164,2	148,5	75,7
TOTAL :	13 000,0	6 086,1	6 179,9	734,0	72,2	1 749,9	3 184,5	3 519,5	2 944,4	795,4

(1) 1 976,6 : Canada (59,18 %) = 1 169 700 $ / Québec (40,82 %) = 806 900 $
(2) 1 704,4 : Canada (50,31 %) = 857 500 $ / Québec (49,69 %) = 846 900 $
(3) 477,8 : Canada (73,55 %) = 351 400 $ / Québec (26,45 %) = 126 400 $

APPROUVÉ PAR LE COMITÉ DE GESTION

Normand Lafrenière 29-3-94
NORMAND LAFRENIÈRE, Coprésident — DATE :
Gouvernement du Canada

André Vézina 94.03.28
ANDRÉ VÉZINA, Coprésident — DATE :
Gouvernement du Québec

[a] There is no English version of the Agreement "Annexe C détaillée".

APPENDIX B

DETAILED DESCRIPTION OF ACHIEVEMENTS OF THE AGREEMENT

Table 6. Achievements of the Agreement by Year

Programs and Activities	1987-1988		1988-1989		1989-1990		1990-1991		1991-1992		1992-1993		TOTAL	
	Operations	Expend. ($'000s)	Operations	Expend. ($'000s)	Operations	Expend. ($'000s)	Operations	Expend. ($'000s)	Operations	Expend. ($'000s)	Operations	Expend. ($'000s)	Operations	Expend. ($'000s)
1. FOREST MANAGEMENT														
1.1 Preparatory and Related Work														
Administration - Quebec financing			n/a	70,5	n/a	461,2	n/a	432,7	n/a	301,9	n/a	73,5	n/a	1 339,8
Administration - joint financing			n/a	113,7	n/a	210,3	n/a	183,5	n/a	243,6	n/a	70,8	n/a	821,9
Silvicultural inventory	6 500 ha [b]	47,9	12 000 ha	111,9	18 100 ha	135,9	13 900 ha [b]	81,5	2 180 ha [f]	29,5			52 680 ha	406,7
Road work			74 km	149,0	63 km	289,7	89 km	103,1	151 km	87,5	98 km	22,8	475 km	652,1
Vehicles			n/a	39,9	n/a	29,7	n/a	16,4	n/a	12,6	n/a	5,1	n/a	103,7
Operational follow-up			n/a	unavailable [c]	n/a	23,2	n/a	34,4	n/a	27,0	n/a	5,2	n/a	89,8
Other	n/a	24,3	n/a	47,8	n/a	16,4	n/a	9,2	n/a	7,2	n/a	4,5	n/a	109,4
Sub-total [a]	**n/a**	**72,2**	**n/a**	**532,8**	**n/a**	**1 166,4**	**n/a**	**860,8**	**n/a**	**709,3**	**n/a**	**181,9**	**n/a**	**3 523,4**
1.2 Site Preparation and Stand Conversion														
Site preparation					100 ha	60,0	169 ha	116,6					269 ha	176,6
Stand conversion			187 ha	134,3	493 ha	405,2	349 ha	288,3	355 ha [f]	310,7	53 ha	48,8	1 437 ha	1 187,3
Operational follow-up			n/a	unavailable [c]	n/a	32,1	n/a	113,0	n/a	71,5	n/a	11,2	n/a	227,8
Sub-total	**0 ha**	**0,0**	**187 ha**	**134,3**	**593 ha**	**497,3**	**518 ha**	**517,9**	**355 ha**	**382,2**	**53 ha**	**60,0**	**1 706 ha**	**1 591,7**
1.3 Regeneration Tending														
Plantation tending			102 ha	34,1	278 ha	83,8	637 ha	216,6	371 ha	131,7			1 388 ha	466,2
Natural regeneration tending			1 120 ha	656,7 [d]	1 761 ha	1 161,1	2 050 ha [e]	1 293,0	1 892 ha	1 254,0	536 ha	388,4	7 359 ha	4 753,2
Pest control work					108 ha	44,9							108 ha	44,9
Operational follow-up			n/a	265,0 [c]	n/a	98,9	n/a	467,0	n/a	318,7	n/a	89,4	n/a	1 239,0
Sub-total	**0 ha**	**0,0**	**1 222 ha**	**955,8**	**2 147 ha**	**1 388,7**	**2 687 ha**	**1 976,6**	**2 263 ha**	**1 704,4**	**536 ha**	**477,8**	**8 855 ha**	**6 503,3**
Forest management sub-total [a]	**0 ha**	**72,2**	**1 409 ha**	**1 622,9**	**2 740 ha**	**3 052,4**	**3 205 ha**	**3 355,3**	**2 618 ha**	**2 795,9**	**589 ha**	**719,7**	**10 561 ha**	**11 618,4**
2. MANAGEMENT, COMMUNICATIONS AND EVALUATION														
Federal financing			**n/a**	**127,0**	**n/a**	**132,1**	**n/a**	**164,3**	**n/a**	**148,5**	**n/a**	**75,7**	**n/a**	**647,6**
TOTAL [a]	**0 ha**	**72,2**	**1 409 ha**	**1 749,9**	**2 740 ha**	**3 184,5**	**3 205 ha**	**3 519,6**	**2 618 ha**	**2 944,4**	**589 ha**	**795,4**	**10 561 ha**	**12 266,0**

[a] Surface area totals do not include forest inventory.

[b] This inventoried area is estimated using the following ratio: 6 inventoried hectares per treatable hectare.

[c] All operational follow-up expenditures for fiscal year 1988-1989 fall under Activity 1.3.

[d] This expenditure includes $71 909 in training costs

[e] This area includes 47 ha tended in a training project under the sub-activity "Administration - Quebec financing".

[f] This data item comes from REXFOR's 1991-1992 report on Agreement results.

Table 7. Jointly Funded Activities by Management Unit [a]

Programs and Activities	Les Escoumins MU		Forestville MU		TOTAL	
	Operations	Expend. ($'000s)	Operations	Expend. ($'000s)	Operations	Expend. ($'000s)
1. FOREST MANAGEMENT						
1.1 Preparatory and Related Work						
Administration - joint financing	n/a	389,5	n/a	432,4	**n/a**	821,9
Silvicultural inventory	35 280 ha	260,0	17 400 ha	146,7	52 680 ha	406,7
Road work	58 km	410,9	417 km	241,2	475 km	652,1
Vehicles	n/a	56,3	n/a	47,4	**n/a**	103,7
Operational follow-up	n/a	56,6	n/a	33,2	**n/a**	89,8
Other	n/a	63,8	n/a	45,6	**n/a**	109,4
Sub-total [b]	**n/a**	**1 237,1**	**n/a**	**946,5**	**n/a**	**2 183,6**
1.2 Site Preparation & Stand Conversion						
Site preparation	269 ha	176,6			269 ha	176,6
Stand conversion	836 ha	796,6	601 ha	390,7	1 437 ha	1 187,3
Operational follow-up	n/a	165,8	n/a	62,0	**n/a**	227,8
Sub-total	**1 105 ha**	**1 139,0**	**601 ha**	**452,7**	**1 706 ha**	**1 591,7**
1.3 Regeneration Tending						
Plantation tending	1 175 ha	405,1	213 ha	61,1	1 388 ha	466,2
Natural regeneration tending	5 077 ha	3 244,3 [c]	2 282 ha [e]	1 508,9 [d]	7 359 ha	4 753,2
Pest control work			108 ha	44,9	108 ha	44,9
Operational follow-up	n/a	836,1	n/a	402,9	**n/a**	1 239,0
Sub-total	**6 252 ha**	**4 485,5**	**2 603 ha**	**2 017,8**	**8 855 ha**	**6 503,3**
TOTAL [b]	**7 357 ha**	**6 861,6**	**3 204 ha**	**3 417,0**	**10 561 ha**	**10 278,6**

[a] Directly funded activities (by Canada and Quebec) are not identified by management unit and, therefore, are not shown in this table.

[b] Surface area totals do not include forest inventory.

[c] This expenditure includes $47 300 in training costs.

[d] This expenditure includes $24 609 in training costs.

[e] This area includes 47 ha tended in a training project under the sub-activity "Administration - Quebec financing".

APPENDIX C

DETAILED INFORMATION ON THE ECONOMIC EFFECTS

Table 8. Estimation of the Economic Effects: Detailed Information

(constant August 1995 dollars)

TYPE OF EFFECTS	AGREEMENT ACTIVITIES												TIMBER PROCESSING			TOTAL
	Preparatory and Related Work				Site Prep. & Conv.		Tending of Regenerated Areas				Mgmt.	Sub-total	Short-term	Long-term	Sub-total	
	Inventory	Roads	Supervision & follow-up	Admin. and other	Silvicultural operations	Supervision & follow-up	Plantation	Natural regeneration	Training	Supervision & follow-up	Commun. & Evaluation					
SOCIOECONOMIC [a]																
Labour (pers-yr)																
Direct	6	7	5	33	26	4	7	118	1	23	10	**241**	211	455	**666**	**907**
Indirect	2	4	1	10	4	1	2	6	0	4	3	**35**	140	301	**441**	**476**
Induced	2	2	1	12	6	1	2	24	0	5	4	**60**	99	213	**312**	**372**
Total	**11**	**13**	**7**	**55**	**35**	**6**	**10**	**148**	**2**	**32**	**16**	**336**	**450**	**970**	**1 419**	**1 755**
Jobs (workers)																
Direct	17	18	14	88	68	11	18	316	3	62	26	**642**	211	455	**666**	**1 309**
Indirect	2	4	1	10	4	1	2	6	0	4	3	**35**	148	319	**468**	**503**
Induced	2	2	1	12	6	1	2	24	0	5	4	**60**	99	213	**312**	**372**
Total	**21**	**24**	**16**	**110**	**78**	**13**	**21**	**346**	**4**	**71**	**33**	**737**	**458**	**988**	**1 446**	**2 183**
Salaries and wages ($'000s)																
Direct	247	197	154	1 269	740	122	194	3 410	45	674	376	**7 426**	8 629	18 608	**27 237**	**34 663**
Indirect	54	112	18	279	106	14	45	148	10	79	83	**949**	4 623	9 971	**14 594**	**15 543**
Induced	66	62	33	341	164	26	47	680	12	146	101	**1 679**	2 776	5 986	**8 762**	**10 442**
Total	**368**	**371**	**205**	**1 888**	**1 010**	**162**	**285**	**4 239**	**67**	**900**	**559**	**10 054**	**16 028**	**34 565**	**50 594**	**60 648**
Value added ($'000s)																
Direct	333	318	227	1 710	1 082	180	364	4 588	61	998	506	**10 367**	14 955	32 251	**47 205**	**57 572**
Indirect	104	171	34	535	174	27	80	263	19	148	158	**1 712**	8 674	18 706	**27 380**	**29 092**
Induced	187	108	58	958	285	46	81	1 185	34	255	284	**3 481**	4 727	10 195	**14 922**	**18 403**
Total	**624**	**597**	**319**	**3 202**	**1 541**	**253**	**525**	**6 037**	**114**	**1 401**	**948**	**15 561**	**28 356**	**61 151**	**89 507**	**105 068**
SOCIAL GAINS																
Social gains from employment ($'000s) [b]																
Direct	23	61	48	117	229	38	60	1 057	4	209	35	**1 879**	1 368	2 949	**4 317**	**6 196**
Indirect	4	9	2	21	9	2	4	15	1	9	6	**82**	903	1 948	**2 851**	**2 933**
Induced	6	5	3	29	14	2	4	58	1	12	9	**143**	236	510	**746**	**889**
Sub-total	**32**	**76**	**52**	**166**	**253**	**42**	**68**	**1 130**	**6**	**230**	**49**	**2 104**	**2 507**	**5 407**	**7 915**	**10 018**
Resource rent ($'000s)																
Sub-total	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**569**	**1 228**	**1 797**	**1 797**
Earnings in foreign currencies																
Sub-total	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**818**	**1 765**	**2 584**	**2 584**
Total	**32**	**76**	**52**	**166**	**253**	**42**	**68**	**1 130**	**6**	**230**	**49**	**2 104**	**3 895**	**8 400**	**12 295**	**14 399**

[a] It should be noted that the different types of socioeconomic effects are not additive.

[b] These estimates do not reflect the fiscal or social reforms that are currently being implemented or that may be implemented by governments.

Table 8. (cont'd) Estimation of the Economic Effects: Detailed Information
(constant August 1995 dollars)

TYPE OF EFFECTS	AGREEMENT ACTIVITIES												TIMBER PROCESSING			TOTAL
	Preparatory and Related Work				Site Prep. & Conv.		Tending of Regenerated Areas				Mgmt.	Sub-total	Short-term	Long-term	Sub-total	
	Inventory	Roads	Supervision & follow-up	Admin. and other	Silvicultural operations	Supervision & follow-up	Plantation	Natural regeneration	Training	Supervision & follow-up	Commun. & Evaluation					
FINANCIAL GAINS FOR GOVERNMENTS																
Fiscal, parafiscal, stumpage fees ($'000s) [b]																
Quebec																
Direct	58	71	48	299	219	38	58	929	11	209	89	**2 029**	2 546	5 490	**8 036**	**10 065**
Indirect	13	28	4	67	27	3	12	36	2	18	20	**231**	1 711	3 689	**5 400**	**5 631**
Induced	27	27	15	138	73	12	21	305	5	65	41	**729**	1 140	2 458	**3 597**	**4 326**
Sub-total	**98**	**126**	**67**	**505**	**319**	**53**	**91**	**1 270**	**18**	**293**	**149**	**2 988**	**5 396**	**11 637**	**17 034**	**20 022**
Canada																
Direct	51	40	26	261	129	21	34	564	9	116	77	**1 328**	2 422	5 223	**7 644**	**8 972**
Indirect	11	22	3	56	20	2	9	27	2	14	17	**182**	902	1 945	**2 847**	**3 029**
Induced	23	23	12	116	61	10	17	256	4	55	34	**611**	954	2 057	**3 010**	**3 622**
Sub-total	**84**	**84**	**42**	**433**	**211**	**33**	**60**	**847**	**15**	**184**	**128**	**2 121**	**4 277**	**9 224**	**13 501**	**15 622**
Savings on unemployment insurance and social assistance ($'000s)																
Quebec	2	33	25	10	123	20	32	563	0	112	3	**924**	232	501	**733**	**1 657**
Canada	16	0	-4	84	-19	-3	-4	-108	3	-17	25	**-26**	568	1 224	**1 792**	**1 766**
Sub-total	**18**	**33**	**22**	**94**	**104**	**17**	**29**	**455**	**3**	**95**	**28**	**898**	**800**	**1 725**	**2 525**	**3 423**
Total	**201**	**244**	**130**	**1 031**	**634**	**103**	**179**	**2 572**	**37**	**572**	**305**	**6 008**	**10 474**	**22 587**	**33 060**	**39 068**

[b] These estimates do not reflect the fiscal or social reforms that are currently being implemented or that may be implemented by governments.